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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,275	07/31/2001	Gregory M. Chrysler	042390.P12135	5708

7590 07/16/2003

Stephen M. De Klerk  
Blakely, Sokoloff, Taylor & Zafman LLP  
Seventh Floor  
12400 Wilshire Boulevard  
Los Angeles, CA 90025-1026

EXAMINER

GEYER, SCOTT B

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Am

<b>Office Action Summary</b>	<b>Application No.</b> 09/920,275	<b>Applicant(s)</b> CHRYSLER ET AL.	
	<b>Examiner</b> Scott B. Geyer	<b>Art Unit</b> 2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 8-17, 25 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-17 is/are allowed.
- 6) ☒ Claim(s) 25 and 27-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 24, 2003 has been entered.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 25 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ravi (5,131,963).

4. As to claim 25, Ravi teach a layer of solid diamond having a thickness of 1 to 2 microns (column 3, lines 32-34) and a layer of semiconductor material (i.e., silicon) next to the layer of diamond having a thickness of 1-2 microns (column 3, lines 21-23).

5. As to claim 27, Ravi teach a layer of semiconductor material (i.e., silicon) next to the layer of diamond having a thickness of 1-2 microns (column 3, lines 21-23).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ravi (5,131,963) as applied to claim 25 above, and further in view of Pollock et al. (EP 0814 5098 A2) and official notice.

8. As to claim 28, Ravi teaches all of the claimed limitations as noted above except for a plurality of integrated circuits in rows and columns on a side of the semiconductor material opposing the layer of solid diamond. However, Pollock et al. teach in figure 2: a layer of solid diamond (12), a layer of semiconductor material (14) on the diamond layer and an integrated circuit (21) on the side of the semiconductor material opposite the layer of diamond. Pollock et al. further teach the diamond film having a thickness of 10-20 mils (254-508 microns) (see column 3, lines 46-48). Pollock et al. also teach formation of a plurality of electronic devices on the entire substrate structure, which is graphically represented by numeral 21 in figures 1 and 2 (see column 3, lines 35-41). Official notice is taken that it is well known in the art of semiconductor devices that a plurality of devices would be formed on a wafer surface in a pattern of rows and columns. It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the wafer of Ravi with an integrated circuit device as taught by Pollock et al. so as to provide a thinner, and thus smaller and

more lightweight semiconductor package. It would also have been obvious to a person of ordinary skill in the art at the time of the invention to modify the wafer of Ravi and Pollock et al. with a plurality of integrated circuits in rows and columns to facilitate ease in separation with a dicing saw at the time when the individual dies would be needing separation from the wafer for further packaging.

9. As to claim 29, Ravi teach, in figure 1g, a layer of polysilicon (14), a layer of diamond (13) and a layer of single crystal silicon (12), such that the polysilicon is a layer of semiconductor material on a side of the layer of solid diamond opposing the layer of monocrystalline semiconductor material.

#### ***Response to Arguments***

10. Applicant's arguments filed 6-24-03 have been fully considered for claims 12-17 but are moot in view of claims 12-17 noted as allowable below.

11. Applicant's arguments with respect to claim 25 have been considered but are moot in view of the new ground(s) of rejection. Further, the applicant presented no substantial arguments for claim 27 other than that claim being dependent upon claim 25, which the applicant viewed as possibly allowable. Claims 28 and 29 are newly presented claims.

#### ***Allowable Subject Matter***

12. Claims 8-17 are allowed.

13. The following is a statement of reasons for the indication of allowable subject matter: Independent claim 8 was noted as allowable in the previous office action, paper no. 10. Claims 9-11 are dependent upon claim 8. Independent claim 12, as amended,

recites a layer of solid diamond having a thickness of less than 150 microns and a layer of monocrystalline semiconductor material on the layer of solid diamond, with a bonding material bonding the layer of solid diamond to the layer of monocrystalline semiconductor material. The prior art of record and to the examiner's knowledge does not teach or render obvious, at least to the skilled artisan, the instant invention regarding a bonding material bonding together a layer of solid diamond having a thickness less than 150 microns to a layer of monocrystalline semiconductor material, in conjunction with the other claimed limitations. Claims 13-17 are dependent upon claim 12.

### ***Conclusion***

**14.** This action is ***NON-FINAL***.

**15.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott B. Geyer whose telephone number is (703) 306-5866. The examiner can normally be reached on weekdays, between 10:00am - 6:30pm. E-mail: [scott.geyer@uspto.gov](mailto:scott.geyer@uspto.gov)

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (703) 308-1233. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Application/Control Number: 09/920,275  
Art Unit: 2829

Page 6

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SBG

SBG  
July 1, 2003

  
EVAN PERT